



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,127	12/15/2003	Masaru Kamiya	118077	9137
25944	7590	01/18/2006		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER EDWARDS, LOREN C	
			ART UNIT 3748	PAPER NUMBER

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

Office Action Summary	Application No.	Applicant(s)	
	10/734,127	KAMIYA ET AL.	
	Examiner	Art Unit	
	Loren C. Edwards	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-11, 18-20, 24, 25, 27, 28, 30 and 31 is/are rejected.
- 7) ☒ Claim(s) 6, 12-17, 21-23, 26, 29 and 32 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/18/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been placed in the file of record.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 4/28/05 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-3, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff et al. (U.S. Pat. No. 6,240,890) in view of Griffin et al. (U.S. Pat. No. 6,202,406). Abthoff discloses an engine starting apparatus for starting an engine by

Art Unit: 3748

using at least a starter (Fig. 1, No. 1 and 2; Col. 2, Lines 24-29), comprising an engine condition judging means for judging whether the engine is in a cold start condition or not (Abstract; Col. 3, Lines 2-17), wherein when starting the engine, if the engine is judged to be in a cold start condition, the engine is started at high speed (Abstract; Col. 2, Line 44 – Col. 3, Line 17), compared with the engine speed when the engine is in a hot condition (Abstract; Col. 2, Line 44 – Col. 3, Line 17). Abthoff fails to specifically discuss the existence of a catalyst condition judging means for judging whether a catalyst for purifying exhaust gas in the engine is in an inactive condition or not and controlling the starting mode based on said catalyst condition. Griffin discloses a method and apparatus for catalyst temperature control that identifies the condition of the catalyst (Abstract) and controller that adjusts one or more operating parameters of the engine to cause the catalyst temperature to rapidly rise when the temperature is less than the catalytic operating temperature. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the catalytic condition sensing means as taught by Griffin in the apparatus of Abthoff for the advantage of further control of emissions lowering.

6. In regards to claim 2, the modified Abthoff discloses the engine starting apparatus of claim 1 as described above, and further comprising a first starter having a high torque type output characteristic, and a second starter having a high speed type characteristic, wherein the engine is started at high speed by using the second starter (Abstract; Col. 2, Line 44 – Col. 3, Line 17).

7. In regards to claim 3, the modified Abthoff discloses the engine starting apparatus of claim 1 as described above, and further wherein said catalyst condition judging means judges that the catalyst is in an inactive condition when the temperature of the catalyst is lower than a predetermined temperature (Griffin; Abstract).

8. In regards to claim 28, the modified Abthoff discloses the engine starting apparatus of claim 1 as described above, and further wherein the fuel injection is started after it is detected that the engine speed is higher than a predetermined speed (Fig. 5; Col. 3, Line 18-35).

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 1 above, and further in view of Hirota et al. (U.S. Pat. No. 6,481,200). The modified Abthoff discloses the engine starting apparatus of claim 1, as described above, but fails to specifically discuss the catalyst condition judging means judging that the catalyst is in an inactive condition when oil temperature or coolant temperature of the engine is lower than a first predetermined temperature. Hirota discloses a catalyst warming apparatus of an internal combustion engine that determines if a catalyst is active or not using the cooling-water temperature (Col. 14, Lines 17-34). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize catalyst state judging means as taught by Hirota in the apparatus of Abthoff for the advantage of being able to estimate catalyst temperature when no exhaust is flowing.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 1 above, and further in view of Cullen (U.S. Pat. No. 5,832,721). The

Art Unit: 3748

modified Abthoff discloses an engine starting apparatus as described in claim 1 above but fails to specifically discuss the apparatus further wherein the catalyst condition judging means judges that the catalyst is in an inactive condition when the engine has been in a stopped condition for more than a predetermined length of time. Cullen discloses a method and system for estimating a temperature of a catalytic converter in an exhaust system that uses the length of time that the engine has been off to determine the state of the catalyst (Col. 4, Lines 38-49). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the catalyst state judging means as taught by Cullen in the apparatus of Abthoff for the advantage of being able to estimate the state of the catalyst when the engine has just been started.

11. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 1 above, and further in view of Clark (U.S. Pat. No. 2,989,873). The modified Abthoff discloses an engine starting apparatus as claimed in claim 1, as described above, but fails to specifically discuss the motor control comprising means for controlling an output characteristic of a motor provided in the starter, and wherein the motor control means control the output characteristic of the motor to a high speed type, thereby allowing the engine to be started at high speed. Clark discloses engine-starting equipment that comprises a speed ratio changing device that is able to control the output characteristic of the motor (Col. 1, Line 61 – Col. 2, Line 6). It would have been obvious to one having ordinary skill in the art at the time the

Art Unit: 3748

invention was made to utilize the motor control of Clark in the apparatus of Abthoff for the advantage of being able to speed of the engine starter with only one motor.

12. In regards to claim 20, the modified Abthoff discloses the engine starting apparatus of claim 7, as described above, and further wherein the motor provided in the starter is a DC motor (Clark; Col. 1, Line 60 – Col. 2, Line 5)

13. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 7 above, and further in view of Thexton et al. (U.S. Pat. No. 5,875,281). The modified Abthoff discloses the engine starting apparatus of 7, as described above, but fails to specifically discuss the motor control means controlling the output characteristic of the motor to the high speed type by reducing the field current of the motor. Thexton discloses a DC solid-state series wound motor that is able to increase the rotational speed of a DC motor by decreasing the field current (Col. 6, Lines 40-52). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the rotational speed increasing method of Thexton in the apparatus of Abthoff for the advantage of being able to increase the speed of a DC motor without using mechanical methods.

14. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 8 above, and further in view of Machinery's Handbook, 27th Edition. The modified Abthoff discloses the engine starting apparatus of claim 8, as described above, but fails to specifically discuss the motor having a series coil and a shunt coil, and where the motor control means comprises an energization circuit which can energize the shunt coil in such a manner that the field current flowing in the shut coil is

Art Unit: 3748

opposite in direction to the field current flowing in the series coil, and the motor control means reduces the field current of the motor by controlling, through the energization circuit, at least either the amount of the current or the direction of the current flowing in shunt coil. Machinery's Handbook discloses, "In the compound-wound motor, both series and shunt field windings are provided and these may be connected so that the currents in both are flowing in the same direction, called cumulative compounding, or so that the currents in each are flowing in opposite directions, called differential compounding" (Page 2468; Types of Direct-Current Motors). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the differential compounding as taught by the Machinery's Handbook in the apparatus of Abthoff for the advantage of being able to increase the motor speed very rapidly.

15. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 8 above, and further in view of Roseman et al. (U.S. Pat. No. 6,153,942). The modified Abthoff discloses the engine starting apparatus of claim 8, as described above, but fails to specifically discuss the motor control means including a field current reducing means capable of reducing the field current flowing in a field coil of the motor, and the motor control means reducing the field current of the motor by using the field current reducing means. Roseman discloses a starter cutoff control apparatus that detects the starter armature current during the engine start operation and generates a field weakening control signal based on this (Abstract; Col. 2, Lines 3-20). It would have been obvious to one having ordinary skill in the art at the

time the invention was made to utilize the field current control as taught by Roseman in the apparatus of Abthoff for the advantage of reliable starter cutoff (Col. 1, Lines 57-60).

16. In regards to claim 11, the modified Abthoff describes the engine starting apparatus of claim 8, as described above, and further wherein the motor control means reduces the field current of the motor in accordance with the number of revolutions of the engine or the starter (Roseman; Col. 3, Line 66 – Col. 4, Line 8).

17. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 8 above, and further in view of Hansen et al. (U.S. Pat. No. 4,412,137). The modified Abthoff discloses the engine starting apparatus of claim 8, as described above, but fails to specifically discuss stopping the field current reducing control when a battery is in a low state of charge. Hansen discloses a dual voltage engine starter management system that stops the starting routine entirely when the voltage drops below a predetermined level (Col. 1, Lines 50-63). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the engine start lockout function as taught by Hansen in the apparatus of Abthoff for the advantage of protecting the starter solenoid.

18. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 9 above, and further in view of Hansen. The modified Abthoff discloses the engine starting apparatus of claim 9, as described above, but fails to specifically discuss the motor control means stopping the reduction of field current when the power supply means is at a lower state of charge than a predetermined battery charge level. Hansen discloses a dual voltage engine starter management system that

Art Unit: 3748

alters the starting routine when the voltage drops below a predetermined level (Col. 1, Lines 50-63). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the engine start change function as taught by Hansen in the apparatus of Abthoff for the advantage of protecting the starter solenoid.

19. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 2 above, and further in view of Tamai et al. (U.S. Pat. No. 6,769,389). The modified Abthoff discloses the engine starting apparatus of claim 2, as described above, but fails to specifically discuss the engine being started by using the first starter when the state of charge of a battery is low. Tamai discloses a dual voltage tandem engine start system and method that switches between a high-voltage motor and a low-voltage motor depending on the amount of voltage in the batteries (Fig. 2A, Steps 104 and 110; Col. 4, Line 58 – Col. 5, Line 52). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the starter selecting technique as taught by Tamai in the apparatus of Abthoff for the advantage of being able to start the engine when the voltage of the system is below the necessary voltage for normal starting.

20. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 1 above, and further in view of Iwata et al. (U.S. Pat. No. 4,739,741). The modified Abthoff discloses the engine starting apparatus of claim 1, as described above, but fails to specifically discuss that when the engine speed is higher than a predetermined speed, the amount of fuel injection is reduced compared with a case where the catalyst is in an active condition. Iwata discloses a fuel supply control

method for an internal combustion engine that reduces the injected fuel quantity according to the engine speed (Abstract; Fig. 4). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the fuel injection control as taught by Iwata in the apparatus of Abthoff for the advantage of enhancing the stability of the engine at startup (Col. 2, Lines 5-11).

21. Claim 27 rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 1 above, and further in view of Bayerle et al. (U.S. Pat. No. 6,796,293). The modified Abthoff discloses the engine starting apparatus of claim 1, as described above, but fails to specifically discuss the fuel injection being started after it is detected that an intake manifold pressure in the engine is lower than a predetermined value. Bayerle discloses a method for starting an internal combustion engine where by the fuel injection only occurs after the intake manifold pressure is less than a predetermined value (Fig. 2, Steps 4-5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the manifold pressure test as taught by Bayerle in the apparatus of Abthoff for the advantage of fuel quickly evaporating at low suction pipe pressure (Col. 2, Lines 33-37).

22. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 1 above, and further in view of Nakajima et al. (U.S. Pat. No. 6,275,759). The modified Abthoff discloses the engine starting apparatus of claim 1, as described above, but fails to specifically discuss fuel injection being started after it is detected that a predetermined time has elapsed from a start of the engine. Nakajima

Art Unit: 3748

discloses an automatic engine stop and restart system for a vehicle wherein during the automatic engine restart operation a controller first cranks the engine without fuel injection for a predetermined time duration and then starts the fuel supply (Claim 15). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the engine starting routine as taught by Nakajima in the apparatus of Abthoff for the advantage of increasing the pressure in the engine before start.

23. Claim 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Abthoff as applied to claim 1 above, and further in view of Itou et al. (U.S. Pat. No. 6,145,305).

The modified Abthoff discloses the engine starting apparatus of claim 1, as described above, but fails to specifically discuss when starting the engine, basing a threshold speed for perfect combustion on engine speed. Itou discloses a deterioration diagnosing system for a catalyst in an internal combustion engine system that bases a setting for stoichiometric combustion on engine speed (Col. 4, Lines 44-55). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the stoichiometric target setting means as taught by Itou in the system of Abthoff for the advantage of efficiency and to minimize pollutants.

Allowable Subject Matter

24. Claims 6, 12-17, 21-23, 26, 29, and 32 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

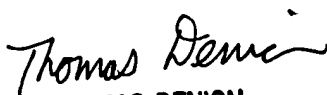
25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koelle et al. (U.S. Pat. No. 6,531,787); Shiroyama et al. (U.S. Pat. No. 6,018,199); DE 197 05 610 A1

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Loren C. Edwards whose telephone number is (571) 272-2765. The examiner can normally be reached on M-TH 5:30-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Loren Edwards


THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700